IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of

Fredrik GUNNARSSON et al   Atty. Ref.: 4147-187

Serial No. 10/594,122   TC/A.U.: 2617

                                  Examiner:Kathy W. WANG-HURST
Filed: September 25, 2006
                                  Confirmation No.:7362

For: METHODS OF AND APPARATUSES FOR CELL-DIFFERENTIATED
HANDOVER IN A MOBILE COMMUNICATIONS SYSTEMS

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November 25, 2009

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REPLY BRIEF

Appellants hereby submit this Reply Brief under the provisions of 37 C.F.R. 1.193(b).

The arguments set forth in the Appeal Brief dated July 10, 2009 are incorporated by reference.

The following discussion is presented in response to the Examiner's Answer of September 30,

2009.

Claims 39-48 and 52-66 remain pending and stand rejected under 35 U.S.C. §103(a) over

U.S. Patent No. 5,428,816 to Barnett et al ("Barnett") in view of U.S. Patent No. 4,670,899 to

Brody et al ("Brody"). In the Examiner's Answer, Examiner continues to allege:

> Barnett discloses classifying neighboring cells into different classes and each
> class being associated with a different signal strength for handover purposes (see
> col. 7 lines 3-12). For example, Barnett discloses the neighboring cells being
> classified into Class I, II and III with Class II having a threshold greater than

RSSI-MSR[1] and Class III having a threshold less than RSSI-C (col. 8 lines 11-32). *Examiner's Answer, p.15, ll.12-18.*

C.7, ll.3-12 only discusses classifying neighboring cells to determine the order in which the cells will be included in a measurement list generated by the serving cell.[2] *C.8, ll.11-32* only discusses the process of selecting candidate cells for handoff of the mobile unit based in part on the cell classifications. These portions together do no more than describe the process of selecting one or more candidate neighboring cells for the handoff. The candidate cells are sorted in a preferred ordering for the handoff. *See c.7, ll.13-16.* They do not teach or suggest "wherein a handover signal strength threshold associated to a first handover-related class of said multiple handover-related classes being different from a handover signal strength threshold associated to a second handover-related class of said multiple handover-related classes" recited in claim 39.

For an easier understanding of the distinctions, the following is provided between a non-limiting embodiment of the present invention and Barnett. At the outset, note the problem to be solved that Barnett identifies is completely different from that of the embodiment. It naturally follows that the solutions are also completely different.

Embodiment[3]	Barnett
Object: Selection of a proper handover (HO) threshold for a handover of a mobile user equipment (UE) from one cell to another.	Object: Selection of a best neighbor cell among a plurality of neighbor cells for a handoff of a mobile unit from a serving cell. *See Barnett, c.1, ll.55 et seq.*
Problem: Conventional way setting fixed HO threshold does not account for differing rates of signal quality changes at the UE depending on the type of HO. If the threshold is set too high, UE can hold onto radio resources of multiple cells causing waste. If set too low, not enough time will be provided to successfully complete the handover. *See*	Problem: In mobile assisted handoffs (MAHO), mobile unit can measure signal strengths of neighboring cells and report to the serving cell. Serving cell chooses the best neighbor based on the report. However, mobile unit can only measure 12 signals simultaneously. When there are more than 12 neighboring cells, serving cell sends a list

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[1] Applicants assume Examiner intended to write "RSSI-MSR" instead of "RSSI-SRV".
[2] The classification is performed during system configuration.
[3] This is one of several embodiments of the present invention.

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original specification, p.2, ll.5-22.	(measurement list) of 12 neighboring cells at a time to mobile unit to measurement, and the best from the list is selected. Thus, it's only by chance that truly the best neighboring cell will be in the measurement list for selection by the serving cell. *See Barnett, c.1, l.35 – c.2, l.2.*
Solution: Classify cells of said communications system into multiple handover-related classes based on radio coverage characteristics associated with the cells and assign a different HO threshold for each class. By setting the HO threshold appropriately for each handover type, sufficient time is provided to successfully complete the handover while minimizing unnecessary simultaneous holding of radio resources by the UE.	Solution: Prioritize all neighboring cells and sort them in a preferred ordering for handoff at system configuration. *See Barnett, c.6, l.63 – c.7, l.24.* When the mobile unit is moving away from the serving cell, generate a measurement list of neighboring cells in order from the most preferred and send the list to the mobile unit for measurement. If a candidate cell (neighbor) is selected, initiate handoff to the selected cell. If no candidate is selected, replace the measurement list with another set of neighbors and repeat the process. *See c.7, l.60 – c.7, l.10.* By prioritizing the neighboring cells at configuration and generating the measurement list in the preferred order prior to handoff, even if there are more neighboring cells than that can be measured by the mobile unit simultaneously, the best neighboring cell will be selected for handoff.

One main difference is that in the embodiment, the HO thresholds for different HO-related classes are set for use during the handover process itself. In Barnett, the threshold criteria for the handoff process is the same regardless of the cell classification.

Barnett's process is as follows. The serving cell generates a measurement list of one or more neighboring cells and requests the mobile unit to measure the traffic channels of the cells in the list. If the report from the mobile unit indicates that no cell in the list meets the predetermined handoff criteria, then the serving cell generates a new list and the process is repeated. If any one cell meets the predetermined criteria, a handoff is performed to one of the cells meeting the criteria.

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The serving cell uses the cell classification only to determine the order of initial entry of the neighbor cells in the measurement list (higher priority cells are entered first in the list). *See Fig. 5, c.8, ll.11-32.* However, the same predetermined criteria is applied to all cells in the list in determining the candidate cells. *See Figs. 6 and 7; c.8, ll.33-68.* Indeed, even during the candidate cell selection process, the cells in the measurement list are sorted purely based on the reported signal strengths of the neighboring cells. *See Fig. 7; c.9, ll. 1-10.* The effect is that a lower classified cell could be preferred over a higher classified cell for the actual handoff. This is another indication that the cell classification has no bearing in setting thresholds for handoffs. In selecting the cell for the handoff itself, a single threshold is used as illustrated in Fig. 8. *See also c.9, ll.37-56.* As seen, same test is applied without regard to classifications of cells.

This is in complete contrast to the feature of "wherein a handover signal strength threshold associated to a first handover-related class of said multiple handover-related classes being different from a handover signal strength threshold associated to a second handover-related class of said multiple handover-related classes" recited in claim 39.

Examiner also continues to allege that Barnett discloses classifying the cells to assign different handover signal strength thresholds associated with different handover-related classes and again cites c.7, ll.3-12 and c.8, ll.32. *Examiner's Answer, p.15, l.19 – p.16, l.5.* As demonstrated, the classification in Barnett is simply to determine the order in which the neighbor cells will be included in the measurement list. The predetermined handover threshold criteria itself is the same for all cells. Therefore, Barnett does not teach or suggest "classifying cells of said communications system into multiple handover-related classes based on radio coverage characteristics associated with said cells, each handover-related class comprises multiple cells" recited in claim 39.

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Examiner further continues to allege that Barnett discloses handover signal strength threshold associated with a first handover-related class being different from the handover signal strength threshold associated with the second handover-related class. *Examiner's Answer, p.16, ll.6-15.* Once again, Examiner is directed to Fig. 8 and c.9, ll.36-57 in which a single threshold is applied to all selected cells for performing the handoff. Thus, Barnett actually teaches away from different handover-related classes being associated with different handover signal strength thresholds.[4]

In the Appeal Brief, Applicants demonstrated that Barnett and Brody taken either individually or as a combination guide the one of ordinary skill in a fundamentally different direction from what is claimed by consistently stating that the same signal handover signal strength threshold is used for different cells even if they belong to different classes. Examiner attempts to refute this by asserting that Barnett discloses classifying cells with each class being associated with a different signal threshold. As shown, Barnett uses classes only to determine the order of entry of the cells in the measurement list. Thus, the attempt is without merit.

In the Appeal Brief, Applicants demonstrated that Barnett does not teach or suggest "generating a handover triggering command based on measured signal quality for a communications link between said user equipment and a base station of a cell and on an assigned handover signal strength threshold associated with the handover-related class of said cell" recited in claim 39. Examiner cursorily addresses this issue in (9) Grounds of Rejection part of the Examiner's Answer.[5] *Examiner's Answer, p.3, ll.20-23.* Examiner relies upon Barnett, c.8, ll.34-

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[4] Barnett also discloses a cell being included in the candidate list when RSSI-NBR (strength of signal of neighbor measured by mobile unit) is greater than RSSI-THP (cell selection criteria applicable to all cells and forming no part of Barnett's invention, *see c.6, ll.26-30*) which further indicates that handover threshold criteria is non-class based.
[5] No response is provided in the section DETAILS OF APPELLANT'S ARGUMENT AND EXAMINER'S RESPONSE.

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67, which describes Fig. 6 illustrating specific steps of generating the measurement list, sorting sending the measurement list to the mobile unit, selecting candidate neighbor cells based on the report, and generating new measurement list to repeat the process. There is no triggering of handoff in these steps other than a reference to Fig.8 in step 102 which occurs only after the measurement process is finished. As demonstrated, the handoff criteria in Fig. 8 is the same for all cells regardless of their classification. Thus, again contrary to Examiner's assertion, Barnett does not teach or suggest the feature of generating the handover triggering command as recited.

For at least these reasons, Examiner's rejection of claim 39 and the dependent claims thereon are in clear error. Similar arguments apply mutatis mutandis to independent claim 52 and the dependent claims thereon.

Independent claims 40, 55 and 62 are respectively directed toward a method, a unit, and a user equipment unit for modifying a list of connected cells for the user equipment in a cellular communications system. In the Appeal Brief, Applicants amply demonstrated that the Barnett and Brody do not disclose all steps of the method recited in claim 40 including the steps of "receiving a handover signal strength threshold for said cell, said handover signal strength threshold being determined based on the radio coverage characteristics of said cell" and "modifying said list based on said measured signal quality and said received handover signal strength threshold."

Examiner in response refers to c.2, ll.40-60 of Barnett. *Examiner's Answer, pp.15-16.* This is nothing more than a repeat of Barnett's summary of invention. There is nothing to indicate that the handover signal strength threshold for the cell is received. Since the handoff threshold is the same for all cells, such information would seem unnecessary. In addition, the mobile unit in Barnett performs little more than provide measurement reports to the serving cell when requested. The mobile unit itself does not receive any threshold information and does not

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modify any list whatsoever. Thus, contrary to Examiner's assertion, Barnett fails to teach or suggest "receiving a handover signal strength threshold for said cell, said handover signal strength threshold being determined based on the radio coverage characteristics of said cell" and "modifying said list based on said measured signal quality and said received handover signal strength threshold."

For at least the reasons stated above, independent claim 40 and the claims dependent thereon are patentable over Barnett in view of Brody. Similar arguments apply mutatis mutandis to independent unit claim 55 and independent user equipment claim 62. Consequently, claims 55 and 62 and the claims dependent thereon are patentable over Barnett in view of Brody.

In addition, since Barnett and Brody combination discloses using the same handover threshold, the combination cannot teach or suggest assigning different handover signal strength thresholds for different classes and cannot teach or suggest each handover-related class being associated with a unique handover signal strength threshold recited in claims 41, 56 and 63.

For at least the reasons set forth above and discussed in detail in the previously filed Appeal Brief, it is respectfully requested that the rejections on Appeal be reversed.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____
            Hyung N. Sohn
            Reg. No. 44,346

HNS/edg
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

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